

Study on the parasitoids of *Pissodes nitidus* Roel.

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Abstract: A systematic observation and intensive study on the parasitoids of *Pissodes nitidus* were made in Langxiang and Xin'qing Forestry Bureau in Xiaoxing'an Mountain area in 1996-1999, including the diagnosis, life history, biological characteristics of *Eurytoma* sp. and parasitoid complex of *Pissodes nitidus*. There were about 70 species of parasitoids on *Pissodes nitidus*, including Eurytomidae, Ichneumonidae and Braconidae etc. Among them, *Eurytoma* sp. is a dominant species and a braconid, *Ipobracon* sp. is a subdominant species, and they play an important role in controlling the pest.

Key words: *Pissodes nitidus*; Parasitoids; Biological characteristics; *Eurytoma*

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During 1996 to 1999, we made a systematic observation and intensive study on the parasitoids of *Pissodes nitidus* in Langxiang and Xinqing Forestry Bureau, Xiaoxing'an Mountain region, Heilongjiang Province. The species number of parasitoids on *Pissodes nitidus* is about 70, including Eurytomidae, Ichneumonidae and Braconidae etc. Among them, *Eurytoma* sp. is a dominant species and a braconid, *Ipobracon* sp. is a subdominant species, and they play an important role in controlling the pest.

Eurytoma sp.

Diagnosis

Female: Body length is 2.2-5.1 mm, body black, 3 ocelli purplish black, and eyes are dark red. Antennae is black except scape yellow. POL: OOL=9:5. Antennae has five segmented funicle and three segmented clava. First funicle segment is the longest, about 1.7 times as long as wide, and rest of the funicles is gradually deduce in length and width. All the segments of antennae are covered with short hairs. Thorax is nearly 2 times as long as wide (9:5). Back of thorax and head has honeycomb-like pits. Veins of forewing is covered with short hairs, yellowish brown except parastigma brown. m: pm: s=14: 14: 10.

Femora of fore and middle legs, all tibia and tarsi yellow. Propodeum form 45° angle with body. Petiole short, shorter than width. Abdomen equal in length to total length of head and thorax. Gaster compressed laterally, first to fourth tergites smooth without any pits or hairs, from fifth tergite pubescent, last abdominal tergite slightly turns upward. Ovipositor sheath yellow.

Male: Body length 1.7-3.0 mm. Antennae black. Antennae with five segmented funicle and two segmented clava.

Life history

Eurytoma sp. occurs one generation a year, overwinters in leaders by larval stage from September in Xiaoxing'an Mountain area. Adult emerges from late June. The peak of adult emergence occurs in the middle of July and ends in late July. From late July to the middle of August is egg stage, and from the middle of August to early September is attacking period of larvae, and larvae begin to overwinter from the Middle of September (Table 1).

Biological characteristics

Eurytoma sp. is an ecto-parasitoid. Adult can live 6-14 days in natural condition, and if feed with 15% glucose, it could be live as long as 20 days, at least 8 days, and 11 days in average (data from 30 tested wasps).

Observation of 200 specimens reveals that sex ratio of female and male is 1.4: 1.

After emergence of adults, male parasitoid lie prone on back female's back, its antennae curve

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down wards and contact with or tap female's antennae frequently before mating, but they are at a standstill while mating. Mating can last as long as 16 min and at least 9 min. Most of the mating occurred in bright and sunny daytime, rarely happens in gloomy days. Usually they lay one egg at a time on the first or second star larvae of *P. nitidus*.

Observation reveals that *Eurytoma* sp. needs the opposite ecological environment to the host *P. nitidus*. The pest prefers dry and unclosed southern slop forest stands, but *Eurytoma* sp. are abundant in closed, low humidity forest stands. The most suitable temperature for *Eurytoma* sp. is 15-25°C, and the most appropriate relative humidity is 50%-70%.

Table 1. Life history of *Eurytoma* sp.

Langxiang Forestry Bureau, 1996 to 1999

	May		June		July		August		September		Oct.—April	
Larvae	—	—	—	—	—	—	—	—	—	—	—	—
Pupa			○	○	○	○						
Adults				+	+	+	+					
Egg							•	•	•			
Larvae							—	—	—	(—)	(—)	(—)

Parasitoid complex of *Pissodes nitidus* Roel.

Species of parasitoids

The main parasitoids of *P. nitidus* belong to three categories. Eurytomidae (*Eurytoma* spp.); Braconidae (including *Bracon* spp., *Triastis* spp., *Ipobracon*

spp., *Spathius exarator* L., *Daryctes* spp., *Aleiodes* sp. and *Scambus* spp.); and Ichneumonidae (including *Poemenca* sp., *Exeristes* spp., *Picardiella* sp. and *Venturia* sp.). We also found some super parasitoids, Encyrtidae and Eulophidae which parasite on Braconidae and Ichneumonidae.

Table 2. Categories and number of parasitoids of *Pissodes nitidus* Roel.

Parasitoids	Species number	Percentage of species number	Percentage of specimens number	Note
Chalcidoidea	7	10	87.7	Number of specimens collected =19260
Braconidae	20	29	10	
Ichneumonidae	36	51	2	
Other parasitoids and super-parasitoids	7	10	0.3	
Total	70	100	100	

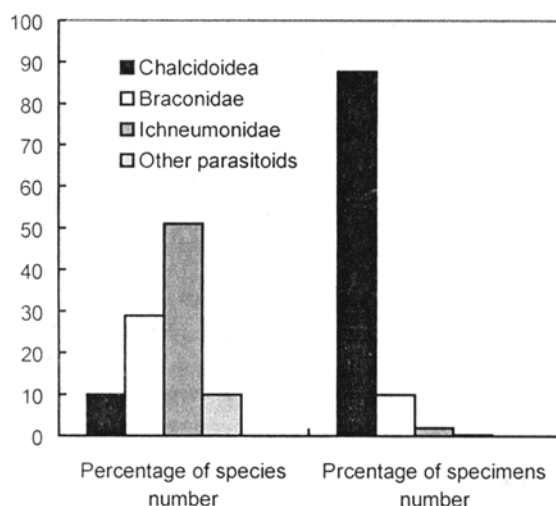


Fig. 1 Percentage of species and specimens number of different parasitoid categories

Table 2 and Fig. 1 shows that the only 7 species of eurytomids occupies the most quantity of parasitoids. As a dominant parasitoids species, Eurytomids play an important role in controlling the pest, and have a broad prospects of utilization in biological control of *P. nitidus*.

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